

IN THE CLAIMS:

1. (Previously presented) A method for producing a metallic article comprising a metallic base, comprising the steps of
furnishing a mixture of at least two nonmetallic precursor compounds together comprising the constituents of the metallic article, wherein the constituents comprise the metallic base selected from the group consisting of nickel, cobalt, iron, iron-nickel, and iron-nickel-cobalt, and mixtures thereof, and at least one alloying element;
chemically reducing the mixture of nonmetallic precursor compounds to produce an initial metallic particle, without melting the initial metallic particle;
melting and solidifying the initial metallic particle to produce a cast ingot of the metallic alloy, wherein the step of melting and solidifying produces an alloy that is a nickel-base superalloy, a cobalt-base superalloy, an iron-base superalloy, an iron-nickel-base superalloy, an iron-nickel-cobalt-base superalloy, or a martensitic steel; and
processing the cast ingot to produce the metallic article.

2-3. (Cancel)

4. (Original) The method of claim 1, wherein the step of melting and solidifying produces an alloy having a martensitic steel composition.

5. (Original) The method of claim 1, including an additional step, performed prior to the completion of the step of melting and solidifying, of
producing a mixture of a metallic material and another additive constituent.

6. (Cancel)

7. (Original) The method of claim 1, wherein the step of chemically reducing includes the step of
chemically reducing the compound mixture by solid-phase reduction.

8. (Original) The method of claim 1, wherein the step of chemically reducing includes the step of

chemically reducing the compound mixture by fused salt electrolysis.

9. (Original) The method of claim 1, wherein the step of chemically reducing includes the step of

chemically reducing the compound mixture by vapor-phase reduction.

10. (Original) The method of claim 1, wherein the step of chemically reducing includes the step of

chemically reducing the nonmetallic precursor compound by contact with a liquid selected from the group consisting of a liquid alkali metal and a liquid alkaline earth metal

11. (Original) The method of claim 1, wherein the step of chemically reducing includes the step of

mixing a nonmetallic modifying element into the nonmetallic precursor compound, wherein the nonmetallic modifying element is selected from the group consisting of nitrogen and carbon.

12. (Original) The method of claim 1, wherein the step of chemically reducing includes the step of

chemically reducing the nonmetallic precursor compound in a time of less than about 10 seconds.

13. (Original) The method of claim 1, wherein the step of melting and solidifying includes the step of

melting and solidifying the initial metallic particle to produce the metallic article, without any addition of a metallic alloying element to the initial metallic particle.

14. (Original) The method of claim 1, wherein the step of melting and solidifying includes the step of

adding a metallic alloying element to the initial metallic particle while the initial metallic particle is melted.

15. (Original) The method of claim 1, wherein the step of melting and solidifying includes the step of solidifying the metallic article as a cast article.

16. (Original) The method of claim 1, wherein the step of melting and solidifying includes the step of melting and solidifying the initial metallic particle without contacting a ceramic material.

17. (Previously presented) The method of claim 1, wherein the step of melting and solidifying includes the step of adding an alloying element.

18. (Original) The method of claim 15, wherein the cast article is a cast ingot, and wherein the method includes an additional step, after the step of melting and solidifying, of
converting the cast ingot into a billet.

19. (Original) The method of claim 1, including an additional step, after the step of melting and solidifying, of
mechanically working the metallic article.

20. (Previously presented) The method of claim 1, wherein the step of processing includes the step of
post processing the metallic article.

21. (Original) The method of claim 1, including an additional step, after the step of melting and solidifying, of
heat treating the metallic article.

22. (Original) The method of claim 1, wherein the metallic article is a superalloy composition, and wherein the method includes an additional step, after the step of melting and solidifying, of

solution heat treating and ageing the metallic article.

23. (Previously presented) The method of claim 1, wherein the metallic article is a martensitic steel composition, and wherein the method includes an additional step, after the step of melting and solidifying, of

heat treating the metallic article to form a martensitic microstructure, wherein the step of heating treating includes the steps of

heating the metallic article above a required temperature, and
cooling the metallic article.

24. (Original) A method for producing a metallic article comprising as constituents a metallic base selected from the group consisting of nickel, cobalt, iron, iron-nickel, and iron-nickel-cobalt, and at least one alloying metal, comprising the steps of furnishing a mixture of at least two nonmetallic precursor compounds together comprising the constituents of the metallic article, wherein the constituents comprise the metallic base selected from the group consisting of nickel, cobalt, iron, iron-nickel, and iron-nickel-cobalt, and at least one alloying metal;

chemically reducing the mixture of nonmetallic precursor compounds to produce an initial metallic particle, without melting the initial metallic particle;

melting and solidifying the initial metallic particle to produce a cast ingot; and
converting the cast ingot into a billet.

25. (Original) The method of claim 24, wherein the step of chemically reducing includes the step of

chemically reducing the mixture by contact with a liquid selected from the group consisting of a liquid alkali metal and a liquid alkaline earth metal.

26. (Cancel)

27. (Previously presented) The method of claim 24, wherein the step of melting and solidifying produces an alloy that is a nickel-base superalloy, a cobalt-base superalloy, an iron-base superalloy, an iron-nickel-base superalloy, an iron-nickel-cobalt-base superalloy, or a martensitic steel.

28. (Previously presented) The method of claim 1, including an additional step, after the step of melting and solidifying of producing a component of a gas turbine engine.

29. (Previously presented) A method for producing a metallic article comprising a metallic base, comprising the steps of furnishing a mixture of at least two nonmetallic precursor compounds together comprising the constituents of the metallic article, wherein the constituents comprise the metallic base selected from the group consisting of nickel, cobalt, iron, iron-nickel, and iron-nickel-cobalt, and mixtures thereof, and at least one alloying element; chemically reducing the mixture of nonmetallic precursor compounds to produce an initial metallic particle, without melting the initial metallic particle; melting and solidifying the initial metallic particle to produce a cast ingot, wherein the step of melting and solidifying produces an alloy that is a nickel-base superalloy, a cobalt-base superalloy, an iron-base superalloy, an iron-nickel-base superalloy, an iron-nickel-cobalt-base superalloy, or a martensitic steel; converting the cast ingot into a billet; fabricating the billet into the metallic article, wherein the metallic article is a component of a gas turbine engine; and heating treating the metallic article prepared in the step of fabricating.